

Assessing the Quality of Green Open Spaces: A review

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Abstract

The fundamentals of urban open space management suggest that a thoughtfully implemented urban development should include more than just great buildings. It should include parks and open spaces because both buildings and open spaces benefit from each other through the quality of each space. Furthermore, it provides benefits from the economical, social, communal, environmental and aesthetical aspects. Parks and open spaces improved the quality of life of cities and neighbourhood by the city amenities and facilities. The conceptual framework on quality of a neighbourhood park in this paper is derived from a multidisciplinary study in the fields of landscape architecture, leisure, recreation, tourism and environment. This framework allows for theory-based consolidation of facts and ideas as well as practical implications for the development of tools to evaluate the aspects of quality in a Malaysian neighbourhood park. Neighbourhood park was chosen as the subject of assessment for this tool because it has social, economic and cultural values on our everyday lives. Not only does it provide revenue benefits for health and mental well-being, it also serves as a societal and community's meeting place for certain residential neighbourhood. This paper critically reviews the outcome of analyses literature that defines the concept of quality for a neighbourhood park. The result from this study is being used to guide future research regarding the development of a framework to define aspects of quality in Malaysian local parks.

Keywords: Needs; Open Spaces; Preferences; Quality Neighbourhood Park; Use Pattern; Malaysia.

Introduction

Local neighbourhood parks are developed and used for numerous purposes, for example recreation, leisurely activities, social and cultural interaction ground, biodiversity as well as habitat protection. As such, the need for parks has been explored extensively across these various purposes. The focus of this paper is to identify measures to assess quality value of parks with regard to the use of local or neighbourhood parks as urban residents gateways to their daily outdoor recreational and leisure venues. As emphasised by McRobie (2000) and Christiansen, Conner, and McCrudden, SUPER group (2001), parks are primarily designed for recreation and can give enormous benefits to the neighbourhood and community by improving health, social well-being and enhancing enjoyment of the local environment. Similarly, benefits of leisure also cover physical health, psychosocial well-being, self-actualization, spirituality and self-identity, family bonding, child development, environmental education and social skills development (Veal and Lynch, 2001). The important role of urban open spaces is recognized both in the character and the life they bring to towns and cities around the world. Urban open spaces must provide a place for meeting, whether for strangers or a place for a person to be alone or for those who can transcend within the crowd and be anonymous (Ward Thompson, 2002).

Today, all categories of open spaces have different kinds of opportunities and constraints. To date, little research has been carried out to explore and identify the needs and preferences as well as the effect of the perception and recreational use of users including parents and children towards park facilities, trails and it's surroundings (Linsey, 1999; Bjerke et al., 2006; Arnberger, 2006; Tucker et al., 2007) towards achieving a quality park or in this paper it is specified as, neighbourhood park. As stated by Gobster (1995), more research is needed to understand how location, size and number (Lo, Yiu and Alan, 2003), design and management of trails and open spaces affect use patterns, perceptions and preferences of users. Enhancing the quality of open spaces include natural features and provision of social interaction as well as reducing the level of annoyance would help to improve the quality and access to neighbourhood parks which will directly contribute to the increasing amount of outdoor activities especially among older people (Sugiyama and Ward Thompson, 2008).

The purpose of this review is to help fill in the gaps as elaborated by Bell, Hamilton, Montarzino, Rothnie, Travlou, and Alves (2008) in a study which stated that more methods were required for evaluating projects, so as to obtain a high quality of evidence for better methods of action research. They also mentioned that, more research is needed to develop practical planning tools and decision support system which, as in this review, attempts to

assess the quality of neighbourhood park through the understanding of park users' preferences, needs and use pattern. As suggested by Crowford, Timperio, Giles-Corti, Ball, Hume, and Roberts (2008), more research is required to examine relations between the quality of parks, as well as park features, and other key determinants. That is the reason, why the goal of this review is to understand the strength of interrelationships among the constructs of quality neighbourhood parks, satisfaction, preferences, needs and use pattern, which should better equip park managers and designers to develop and manage neighbourhood parks. It is important to focus on improving the quality of open spaces, including their natural features and the provision for social interaction (Sugiyama and Ward Thompson, 2008)

A study in the UK by Williams and Green (2001) reviewed the literature on public spaces and local environments and found that several key factors that undermine public spaces, which includes the undermining of the quality of public spaces or their use. Among the key factors were traffic, business activity, anti-social behaviour and crime, poor design, conflicting roles and privatization of the public realm. In addition, another study, also in the UK, stated that 'design often lies at the heart of what makes a successful urban green space'. Therefore, design is also a key part of tackling many of the barriers to the use of urban green spaces (Dunnet, N., Swanwick, C., & Woolley, H., 2002, p. 18). This paper aims to: a) review the literature to consider the definition of quality in the context of neighbourhood park settings and that quality principles are important in evaluating the success of a neighbourhood park, b) to propose a structural model to evaluate the quality criteria, and c) to use a case study approach to demonstrate the usefulness of the structural model within the context of neighbourhood parks.

For the purpose of this review, several inclusion and exclusion criteria will be addressed. This review will only include studies that are reporting the impact or affects of green spaces on quality or success of green open spaces within residential areas, preferences factors, human needs factors, use pattern and user focus or users and visitors in general. This will exclude studies that are within the topics of environmental, air or scenic quality, service and performance quality in general, and health behaviours (physical and social). This study will also only include spaces mentioned in studies on neighbourhood parks, residential open spaces, residential green, residential green open spaces and neighbourhood playfields but exclude urban parks in general, backyards and private gardens, forest and national parks, wilderness and wetlands, greenbelt and country parks.

Why do we need research on quality within residential green open spaces?

The lack of consistent association in assessing quality of green open spaces within residential neighbourhood area may be due to difficulties in defining, measuring, and assessing quality of a park or neighbourhood parks. In this study, a structural equation modeling (SEM) method was adopted to validate causal relationship between variables and to examine the association with the quality of a neighbourhood parks.

Chiesura's (2004) study suggested that the current sustainable indicator for urban development which is much related to most city planners and urban designers in their work should take into account the availability of public spaces and green open areas as they have been proven to fulfil the needs and expectations for the satisfaction of their living environment which should lead to a sustainable city. Therefore, the role of park is clear in providing social services and importance towards city sustainability. The valuation of urban parks must start from the appraisal of the needs, wants and beliefs towards sustainable city strategies which are in fact the primary intentions of this research.

On the other hand, Ozguner's and Kendle's (2006) study dictates that landscape professionals often tend to appreciate the richness of the small intimate pictures that nature creates compared to the simpler structures and lines of man-made designs. It should not only imply the interests of professionals responsible for planning and management of urban green spaces, but should also reflect the needs of the general public.

Indeed, there are several benefits that can be learned from this paper. It should be of interest to landscape architects, park designers, urban designers, city planners, architects, developers as well as any other professional involved in the development of a new residential neighbourhood from the public or the park users' point of view. It is a tool to help designers promote qualities and to hinder dissatisfaction about residential green open spaces and thereby help to enhance community development socially, mentally, physically and spiritually. Different forms of open spaces require a range of appropriate benchmark standards (Doick et al., 2009). It will help designers and developers to evaluate their residential and community design options and to generalize in order to optimize quality towards their outdoor settings which are closely related to the requirements from its users.

Relevant theories supporting the quality neighbourhood parks study

To review literature alone is somehow insufficient if there are no links with certain grounded theories. Therefore, this paper solely focused on the theory of reasoned action (TRA) which was among the fundamental theory to behavioural prediction which was developed by Ajzen and Fishbein in 1975. The theory is based on the assumption that human beings are usually quite rational and make systematic use of the information available to them. They argued that people consider the implications of their actions before they decide to engage or not to engage in a given behaviour. According to this theory, a person's intention is a function of two basic determinants, one is personal in nature and the other is reflecting social influences. The personal factor is the individual's positive or negative evaluation of performing the behaviour. This factor is termed *attitude towards the behaviour*. It implies the person's judgement on performing the behaviour, whether it is good or bad, that he is also in favour of or against performing the behaviour. In the general sense, individuals would intend to perform behaviour when they evaluate it positively and when they believe it is important that others think they should perform it. TRA gave brief perspectives and social themes of human behaviour in order to understand the true meaning of their perception on personal space that is very important to this research (refer to Figure 1 below). It is the hope of the author that the readers will share the same interest on the relationship between attitude and preferences of park users who use neighbourhood parks in Malaysia as their daily recreational venues. This will help to answer the questions on the preferences, needs, and use pattern of Malaysian park users about their leisure behaviour or outdoor recreational activities in the urban open space areas.

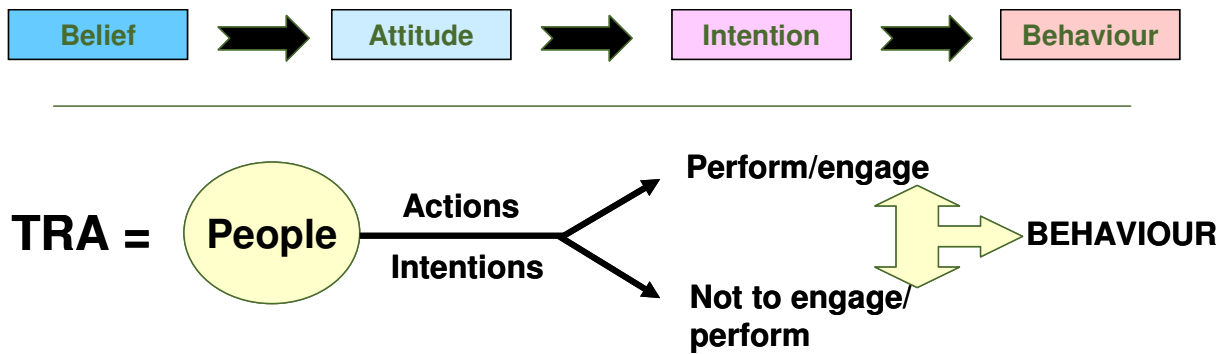


Figure 1: Theory of Reasoned Action diagram. Adapted from Ajzen & Fishbein (1980).

Researches on Quality

In the early work of Parasuraman, Zeithaml and Berry (1985), quality was defined as the ‘gestalt’ attitude towards a service which was acquired over a period of time after multiple experiences with it’ (cited in Baker and Crompton, 2000, p.787). Manning (1986) as cited in Mackay and Crompton (1990), suggested that high quality service in outdoor recreation exists when recreation opportunities meet the needs of its visitors. It is also the degree to which opportunities satisfy the motivations for which they were designed. Hence, the challenge of providing high quality recreational services would become less difficult when agencies are aware of what their patrons desire from their services (Mackay and Crompton, 1990, p.55).

In addition, the value of public open spaces increases because they have the potential to enhance the positive qualities of urban life in term of opportunities, physical settings, sociability and cultural diversity (Burgess, Harrison, and Limb, 1988). Willie (1992) argued that quality is about people and attitudes. Quality is not solely about techniques and procedures but includes people who actually use the techniques or procedures in the context of ‘total quality management’. Among definitions of quality given by Willie are ‘fitness for use’, ‘conformance to requirements’, ‘continuous improvement’, and ‘delighting the customers’. Among the many definitions of quality put forward in the Business Management and Services literature, one of the most famous is that offered by Neil Johnson: ‘Quality is the degree of excellence by which we satisfy the needs of the customer’ (cited in Willie, 1992, p.10).

Smith, Nelischer, and Perkins, (1997) assessed the physical elements that contribute to the quality of a community. The quality community is one which meets the needs and desires of its visitors and inhabitants. This could be evaluated in term of the community open spaces or in this context is the neighbourhood park. Quality according to Smith et al. (1997) refers to the distinguishing properties that promote a degree of excellence or high rank. The quality criteria according to them emerged from the physical form criteria by Lynch (1981). The principle criteria, among others, include the concept of livability, character, connection, mobility, personal freedom and diversity.

In Gobster (1998), various external and internal factors were listed for the success of a community park in North Chicago, United States. Among the external factors are surrounding neighbourhood factors; social diversity of park users; the strong neighbourhood and community group; and a well established advisory council. For the internal factors, the physical design of the park plays an important role as well as management of the park and finally supervision of its users and park management are the key roles in ensuring that a park is successful in serving its diverse users. In a different view, Van Herzele's study (2003) developed and applied an indicator, which serves as a "touchstone" towards the supply of sustainable green areas in Flemish cities using GIS model. The aim is to contribute to the development of methodological approach using indicator towards green space monitoring. The indicator was based on five important principles, i.e. "citizen-based"; "functional levels"; "preconditions for use"; "variety of qualities" and "multiple use" as reference towards green liveability which could be closely related to the intention of this research.

CABE SPACE (2005) work confirms the link between high quality green spaces with the increased housing prices; benefits in improving the image of an area as to attract investment; contribution to biodiversity; contribution in promoting physical activities and the benefits to health; and finally overcoming the anti-social behaviour through design and management. Qualities of a successful green space by CABE SPACE will be adopted in this study as to determine the quality criteria for a neighbourhood park. Among the qualities are sustainability, character and distinctiveness, definition and enclosure, connectivity and accessibility, legibility, adaptability and robustness, inclusiveness and biodiversity.

Only one previous study specifically developed and validated a quality audit instrument similar to what this study would like to achieve and this was in England by Hillsdon, Panter, Foster, and Jones (2006). Other measures reviewed in previous literature were concerning the successful measures towards overall urban open spaces. Therefore, it was important to develop a new instrument to validate the selected variables to achieve

quality in neighbourhood parks or other green open space settings. All reviewed items in Table 1 below, were analysed according to these new measures to assess quality in neighbourhood parks. These new measures of quality consist of 62 items grouped into 4 construct of natural factors, social factors, design factors and external factors. The table below also indicates studies that are relevant to be used in assessing quality of neighbourhood parks depending on their chosen site categorization as well as variables used.

Table 1: Analyses of studies exploring outcome of quality/successful residential green open space, 1984 - 2010						
No.	Year & Source	Country	Site Categorization	Research type	Sample size (N)	Variables relevant to measure quality of neighbourhood parks
1.	(1984) Kaplan, R.	USA	Urban Nature	Theory	-	NF: Natural setting (fascination); various shape and trunk colour trees; Involvement with nature; SF: 'Sense of being' (coherence); active participation; DC: Setting; recreational activities;
2.	(1986) Bradley & Millward	UK	Parks/Green Open Space	Empirical	406	NF: Informal natural or countryside like landscape SF: Use & number of visitors; Social mix of users; value by local people DC: Diversity of activities; upgrade standard of basic facilities such as paths, seats & soft planting;
3.	(1988) Burgess et al.	UK	Local Public Parks/ Neighbourhood Parks	Theory & Empirical	555	NF: Natural environment; changing seasons; feeling the sun, wind & rain; wild patches of land & woods; SF: Recreational needs for children & multi-racial society; outing activities; DC: Accessibility & connection; varied topography and plants; 'non-materialistic' MS: Safety; good maintenance
4.	(1997) Smith et al.	Canada	Urban Community	Theory	-	SF: Walkable community; DC: Outdoor amenities; lots of seating; Accessibility & Connection; Character & Distinctiveness MS: Barrier-free
5.	(1998) Gobster, P.	USA	Public park/neighbourhood boundary parks	Empirical	1290	DC: Good overall & physical design SF: Social diversity of users; strong community groups' supervisions of users MS: Well-established advisory council; surrounding neighbourhood; park management
6.	(2003) CABE Space	UK	Parks & Public Space	Theory	-	NF: Environment & mental health; tree & grass; natural areas; air quality; shade; wildlife SF: Specific needs (children); community gardens; Social inclusions; Social events; DC: Challenging play space; increase lighting; less traffic for cyclists; assessability MS: Secure spaces;
7.	(2005) CABE Space	UK	Green Spaces	Theory	-	DC: Character & distinctiveness; Connectivity & accessibility; Legibility; Adaptability & Robustness; Inclusiveness; Biodiversity MS: Sustainability; enclosure
8.	(2005) Eng & Niininen	UK	Public parks	Empirical	1745	NF: Preserve natural environment SF: Recreational activities for children DC: Accessibility & connection; Facilities; Track for joggers; better lighting; creative space MS: Service quality; safety; good maintenance
9.	(2006) Hillsdon et al.	UK	Urban green space	Empirical	4732	NF: Atmosphere SF: Usage DC: Accessibility & connection; Recreational facilities; Signage & lighting; landscape MS: Good maintenance & services; Amenity provision
10.	(2006) Sanesi & Chiarello	Italy	Urban green space	Empirical	351	NF: Increase the amount of green space; SF: Usage; Space for socializing and leisure; Younger user; accompany by friends, family & pets; relax; air quality; DC: Demand improvement on quantity & quality of green spaces; more facilities; children's play equipment; sports facilities; cycle tracks; dog walking areas; MS: Improvement of management; Funding; Safety & security;

* Indication of abbreviations used: NF= Natural Factors; SF= Social Factors; DC= Design Considerations; MS= Maintenance & Services.

Continuation of Table 1: Analyses of studies exploring outcome of quality/ successful residential green open space, 1984 - 2010						
No.	Year & Source	Country	Site Categorization	Research type	Sample size (N)	Variables relevant to measure quality of neighbourhood parks
11.	(2008) Lange et al.	Switzerland	Green space	Empirical /3D visualization	358	NF: Planting fruit trees or hedgerows; Agriculture scenario; farmland; meadows with orchards; DC: Visual – aesthetics; structured landscape with vegetation elements; MS: Nature conservation; landscape preferences;
12.	(2009) Sugiyama et al.	UK	Neigh. Open Space	Empirical	1,818	NF: Pleasantness and safety SF: Social interaction; sense of community DC: Quality of path and facilities; actual use
13.	(2009) Doick et al.	UK	Urban green space	Case Study	6 sites	NF: Wildlife; more trees & wildflowers; SF: Should promote social diversity & local use; DC: Spaces for diverse activity; should design for walking, relaxing & exercise; Signage & Information boards; quality in design; aesthetics; MS: Biodiversity; site delivery; on-going management; maintenance; safety;
14.	(2009) Chen et al.	China	Urban green space	Empirical	280	NF: Scenic beauty; peace with nature; plants identity; auditory factors; scent/smell; touching sensory; SF: Opportunity of social contact; cultural features; DC: Proximity to residence; visual quality;
15.	(2010) Jim & Chen	Hong Kong	Neighbourhood Parks	Empirical /Case study	18 private Apartments	NF: Natural element (vegetation); aesthetic quality of plants; environmental functions; SF: community pride; humanized; familiar; social interaction; DC: NP raised apartment price; urban aesthetics; conveniently located; easily accessible; MS: Neat & managed; Safe; Economic value;
* Indication of abbreviations used: NF= Natural Factors; SF = Social Factors; DC = Design Considerations; MS = Maintenance & Services.						

Table 1: Table indicating variables that were relevant to assess the quality of green open spaces or neighbourhood parks in this study.

Defining ‘Neighbourhood Park’

The important components of a neighbourhood according to Hester (1984) is a focal point, such as school and recreational area, where each house should be adjoined to a planned open space area although many sociology scholars often debated that a definition of the neighbourhood was irrelevant simply because the concept of neighbourhood was vast and had evolved through time. However, this research will correspondingly use the definition terms of a neighbourhood space instead, where the concept according to Hester is a space limited to the public and that it is an outdoor territory close to home.

A neighbourhood park according to Chapman (1999) is a place where diverse needs are met without the necessity of travelling a long distance, providing basic recreational amenities for all users; it is also usually located within the center of a development. Similarly, Von Kursell’s (1997) thesis defines Neighbourhood Parks as places which serves both active and passive recreation providing a local park function and facilities to a wide range of people. Usually, it contributes to an area of 0.5 to 0.8 kilometer radius or catchment area. Nevertheless, the term neighbourhood park in this study will refer to green open space which is public, available for leisure and recreational purposes similar to those mentioned by

Sugiyama and Ward Thompson (2008) in their research examining the relationship between various aspects of neighbourhood open spaces with older adults walking for transport and recreation. However, neighbourhood parks in this context will only refer to parks that are situated within a community neighbourhood housing area and which offer leisure and recreational purposes for local and immediate communities. For the purpose of this study, a quality of neighbourhood park will be defined as: ‘Quality Neighbourhood Park’ is ‘a successful and excellent public green open space within a residential neighbourhood area that conforms to the needs and requirements of the people including various techniques in using the space and upon agreed standard that is beyond the usual outdoor recreation and leisure expectations’.

Strength of Review

The main revaluation of this review is the importance of predicting and explaining the causal relationship between use patterns, needs, and preferences towards achieving a Quality Neighbourhood Park. A confirmatory path analysis model where the causal or chains of relationship between dependent variables (use patterns, needs, and preferences) to be proven fit against the data collected is shown below (see Figure 2 below). The causal relationship using Structural Equation Modeling (SEM) through path analysis diagram will then lead to the development of a criteria or model for a Quality Neighbourhood Park Criteria (QNPC). This criteria or model can be useful for the future and the new Neighbourhood Park development established within residential areas. This structure will also give the impact to the current body of literature as it will test the selected variables from the current findings developed by various Western scholars within the field of Landscape Architecture and Park and Recreation Management, and it can be developed as a single structure model to be tested against any context or environment. QNPC will be the guidelines or criteria suitable for any park designer or Landscape Architect in their work for developing a quality neighbourhood park.

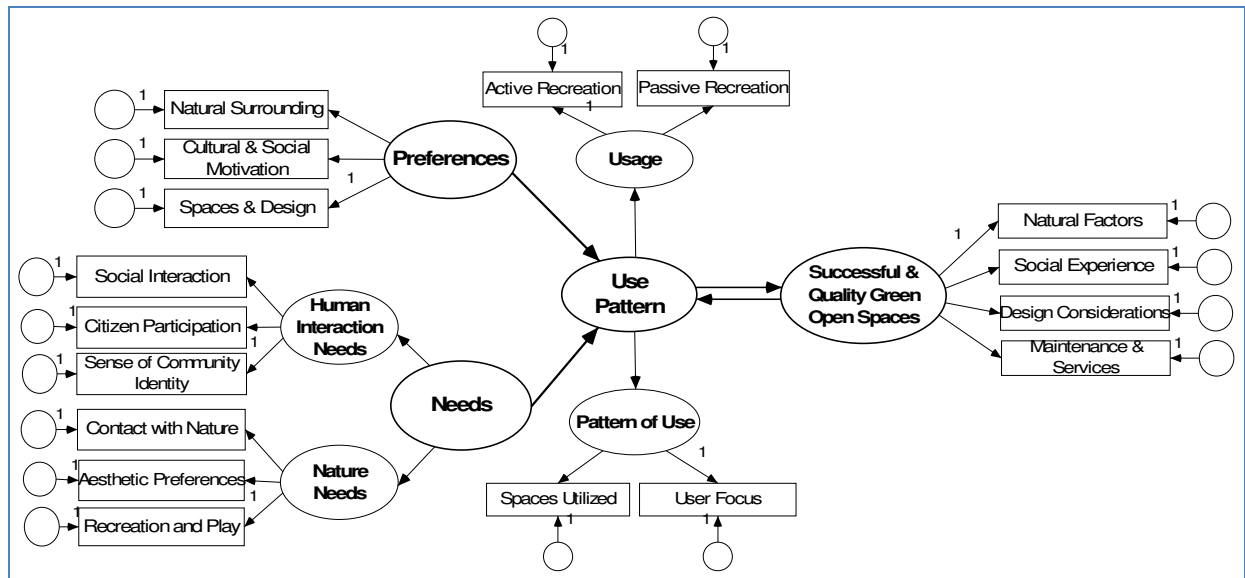


Figure 2: An extended hypothesized model that will be used in this research to identify the Quality Neighbourhood Park.

In summary, the purpose of this paper is to explore the relationship among variables stated in the hypotheses presented below and as described in the path diagram (Figure 1):

- Hypothesis I: Needs will affect park user's use pattern.
- Hypothesis II: Preferences will affect park user's use pattern.
- Hypothesis III: Needs will affect preferences of park users for their recreational activities
- Hypothesis IV: Specific use pattern of park users will affect the success and quality of green open spaces
- Hypothesis V: Better understanding about the use pattern of park users will contribute to the development of a quality Neighbourhood Park
- Hypothesis VI: The success and quality of green open spaces will contribute to better use

Summary and concluding comments

In summary, to achieve quality of a neighbourhood park, several important measures should be addressed as had been discussed on the findings above. Hence, this paper only looked into ways and means in which services and facilities could be improved, the overall and best variables to be considered for a quality neighbourhood park in an urban context, combining the design attributes as well as understanding the overall neighbourhood

satisfaction level, looking into gender, socio-economic status and the cultural background aspects in a neighbourhood park setting.

The role of a park is also very important in increasing the quality of life of the people especially in urban areas. This paper has also specifically looked into the objective of environmental attributes such as the natural recreation resources, environmental quality and man-made recreation attributes as well as the main concepts of livability, environmental quality, quality of life and sustainability, and presented examples of underlying conceptual models as a framework. Apart from that, meeting basic human needs towards urban open spaces in the urban landscape environment is important in order to achieve quality of life and developing the quality of a Neighbourhood Park. This paper focused on fulfilling the needs and perceived usefulness of park users towards a sustainable city development, similarities or differences among park users' preferences, green open spaces in residential neighbourhood as the type of site to be used or as the controlled environment to be tested on the nature and human needs towards a neighbourhood park environment, and finally to identify ethnicity utilization, activities and frequency of use to further indicate the relationship between perceived benefit and park use in the neighbourhood park setting.

Implications for future research

The quality criteria developed through this review should be universally adapted, because it provides a very relevant framework for research in the area of landscape architecture, park and recreation management, urban forestry, and urban planning. At every level of the Malaysian government, recreation and park facilities have captured increasing interest and involvement from all parties and agencies concerned. However, the contribution has not been documented properly (Abdul Malek and Mariapan, 2009). The following research directions could be taken into considerations:

- The reliability and validity of the construct listed could further be tested and improvised to suit the relevant surroundings.
- Opportunity to test the goodness of fits test in SEM.
- The model can be further used to device survey instruments.
- Further research questions or hypotheses could be addressed based on this structural model.
- The results from the model could help future park planners and designers to adopt some basic quality requirements for a better park design and utilisation.

Conclusion

In simple terms, this review has revealed a structural equation model that has taken into consideration relevant and important researches on quality green open spaces and neighbourhood park research. Although quality in the field of recreation and tourism often managed to subscribe to many management and marketing researches, quality in the the field of landscape architecture and recreation remains limited. Hence, research on quality green open spaces as a whole cannot ignore the role of users' satisfaction, preferences, use pattern and needs. As a result, the operational definition and the construct of 'quality of neighbourhood park' developed in this study can be a valid and reliable measure to quantify the success and quality of open spaces as a whole in future research. Due to both theoretical and practical significance, the 'Quality Neighbourhood Parks Criteria' is a tool to help achieve a deeper and more comprehensive understanding on quality towards green open spaces as to increase the quality of life among users.

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